

**Procedures and Requirements for Conducting A
Traffic Impact Study in Baltimore City
Pursuant to Ordinance 06-345**

August, 2007

Baltimore City

Department of Transportation



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Traffic Impact Analysis Glossary:

Access Point = An intersection, driveway, or opening on a public street providing entry to a private development or property.

ADA = Americans with Disabilities Act

Adjacent Street Traffic = All traffic with direct access to a development site

Arterial = A signalized street that primarily serves through traffic and that secondarily provides access to abutting properties, with signal spacing of 2.0 miles or less.

At-Grade Intersection = The location at which two roadways cross and join at the same vertical elevation; access through the intersection may be controlled by traffic signals or stop/yield signs

Background Conditions = Conditions affecting the performance of the transportation network not directly related to the subject development over a designated time period, such as growth in existing traffic volumes, other planned, approved or current developments in the study area, and planned improvements to the transportation network

Capacity = The maximum sustainable flow rate at which vehicles or persons reasonably can be expected to traverse a point or uniform segment of a roadway during a specified time period under given roadway, geometric, traffic, environmental, and control conditions, usually expressed as vehicles per hour.

Collector = A roadway with no control of access linking residential communities with the arterial system

Cycle = The time period required for one complete sequence of traffic signal indications

Delay = The additional time experienced by a roadway user, typically motorists as a result of constrained movements and deviation from ideal or free flow travel speeds

Generator = A land use that attracts vehicle, pedestrian or other modes of traffic

Highway Capacity Manual = A publication of the National Academy of Sciences Transportation Research Board that provides a collection of the state-of-the-art techniques for estimating the capacity and determining the level of service for transportation facilities, first published in the 1950's and most recently published in 2000.

Internally Captured Trip = A trip originating and destined for different land uses within the same development but not traveling on a public street

Level of Service = A qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed, travel time, freedom to maneuver, traffic interruption, comfort and convenience.

Modal Split = The percentage of people using a particular means of transport, such as auto, transit, or walking, to make a trip

Multi-modal = A transportation facility for different types of users, modes or vehicles.

Pass-by Trip = An intermediate stop on the way from an origin to a primary trip destination without a route diversion. Pass-by trips are attracted from traffic passing the site on an adjacent street or roadway that offers direct access to the development.

Peak Hour = The one-hour period of greatest utilization of a transportation facility; weekdays normally have two peaks, one in the morning and one in the afternoon

Phase = A portion of a traffic signal cycle allocated to any traffic movement or combination of traffic movements

Synchro – A macroscopic traffic simulation and signal analysis software based on the methodologies in the Highway Capacity Manual

Split-Phased Mode = A type of signal control where all movements from one side street at a time move concurrently

Trip/ Trip End = A single or one-direction movement by any mode of travel with the origin or destination (exiting or entering) inside the study development.

Total Trips = The total of all trips entering plus all trips exiting a site during a designated time.

1. General

Pursuant to Baltimore City Ordinance 06-345, a Traffic Impact Study (TIS) may be required in order to evaluate a proposed development project's impact on the surrounding transportation network and communities. A study can be required for any type of development project such as residential, institutional, commercial, office, industrial or mixed-use project. The regulations below serve as formal implementation of the Ordinance.

2. Traffic Impact Studies – Required

A Traffic Impact Study is required for any proposed development greater than 15,000 square feet of gross floor area, if the proposed development involves any one of the following:

- 2.1. An impact area, as determined by the Department of Transportation (DOT), that includes an intersection performing at Level of Service “D” or worse; or,
- 2.2 100 or more dwelling units; or,
- 2.3 A gross floor area that equals or exceeds:
 - 2.3.1. 150,000 square feet for warehouse use,
 - 2.3.2 50,000 square feet for any other use.

3. Traffic Impact Studies - Conduct

In order to assist the Applicant in receiving a Building Permit from the City, and pursuant to City law, DOT or an independent Consultant (Registered Professional Engineer) selected by DOT shall perform a TIS to determine if there are any adverse impacts on the traffic flow patterns and parking in the area of the development. If a consultant is used, the Applicant shall certify in the Standard Traffic Impact Study Agreement between the developer and the City (the “Standard Agreement”) that there is no conflict of interest with the assigned consultant. The cost of the Traffic Impact Study shall be incurred in full by the developer.

4. Application Process

As adopted, Ordinance 06-345 provides that a Traffic Impact Study is required upon a developer submitting application for a building permit and/ or zoning approval. However, in order to minimize delay to a development project the Department of Transportation strongly urges developers to request a preliminary TIS determination early-on in the development process (i.e. at the time of submitting documents to the Site Plan Review Committee.) The following outlines the preferred step-by-step process for obtaining a TIS:

- 4.1 Applications for a Traffic Impact Study shall be addressed in the form of a letter to: Chief, Planning Section, Baltimore City Department of Transportation, 417 E. Fayette Street, Room 528, Baltimore, MD 21202. Requests transmitted by phone, email or in-person meeting will not be considered. Requests should also be copied to staff of other agencies involved in the project such as: Planning, Housing, Baltimore Development Corp., etc.
- 4.2 Applications shall state the name, address and phone number of the developer or developer's representative, the location and scope of the project and any maps, drawings, site plans or other information that may be useful to the Department in making a preliminary determination on the need for a Traffic Impact Study. Maps should not be larger than 11" x 17".
- 4.3 Within 10 business days of the receipt of the application, the Director or his designee will notify the applicant:
 - 4.3.1 Whether and, if so, what additional information is needed to evaluate the application; or,
 - 4.3.2 If no additional information is needed, whether a Traffic Impact Study is required.
- 4.4 If a Traffic Impact Study is required, the Director or his designee will schedule a meeting to discuss the Scope of Work of the Traffic Impact Study. DOT staff and/or consultants will participate in the meeting and prepare a scope/budget for the TIS within 10 business days of notification that a TIS is required.
- 4.5 At the scoping meeting the boundaries of the study area will be set by DOT, including determination and selection of intersections to be studied. The finalized Scope of Work and budget, including reasonable overhead costs of DOT, shall be at the sole discretion of DOT.
- 4.6 Upon receipt of the proposed Scope of Work and budget, the developer shall enter into a Standard Agreement. The Standard Agreement outlines the terms and conditions of the study performance, scope, and payment. The Department shall not issue Notice to Proceed on the Traffic Impact Study until an initial payment of 50% of TIS-related expenses is made. Check shall be made payable to: Director of Finance, Baltimore City.
- 4.7 Within **60 days of receipt of payment**, the Department shall transmit the draft Traffic Impact Study to the applicant, along with a statement of charges required for final payment.
- 4.8 If, at any time during the conduct of the Traffic Impact Study, the applicant makes significant changes to the size, use or design of the proposed development, the applicant is required to promptly notify the Director or his/her designee in writing. Upon receipt of said changes, the Department shall promptly adjust the Scope of Work and advise the applicant of additional costs or delay in the completion of the Study.
- 4.9 In the case of a development proposed by a City, State, or Federally agency, the respective Agency will be considered as the Applicant

- 4.10 Designation of Authority - The Director, Department of Transportation hereby designates the Deputy Director for Administration and the Chief, DOT Planning Section, to review and approve all applications for Traffic Impact Studies.

5. Appeals and Exemptions

5.1 Appeals

Any party aggrieved by a decision of the Deputy Director for Administration or the Chief, DOT Planning Section, with regard to the decision to conduct a TIS, the TIS Scope of Work, results of the TIS or mitigation negotiations shall first appeal to the Director before taking any further action.

5.2 **Failure to Perform** - Should DOT fail to perform the study within the required timeline, the applicant may proceed to contract for the TIS with a Consultants appearing on the pre-qualified list for professional engineering services with the Office of Board and Commissioners. The City will refund any payments less administrative fees made for the study to the applicant, as well as release any data relevant to the TIS.

5.3 Expedited TIS when the project has no Traffic Impact

Notwithstanding any other provision of these regulations, if the Director, Deputy Director for Administration, or the Chief of DOT Planning determines, upon DOT's initial receipt and review of the application, that a TIS is required for the proposed work pursuant to the Ordinance, but the proposed work has no traffic impact (e.g. the work is interior alterations that will not increase density or otherwise affect traffic), then within 20 days of receipt of the application, the DOT shall notify the applicant and the relevant building or zoning authority that:

- 5.3.1 Given the nature of the proposed work, the DOT has conducted an expedited TIS and determined that the proposed work has no traffic impact
- 5.3.2 The DOT has determined that no actions are necessary or appropriate to mitigate the traffic impact of the proposed work
- 5.3.3. There is no charge for completion of the TIS, and
- 5.3.4 The TIS requirements have been satisfied for the proposed work

6. Traffic Impact Analysis Methodology

All technical analysis of transportation networks shall use standards and methodology provided by the latest editions of Institute of Transportation Engineers, Highway Capacity Manual (HCM) and Maryland Department of Transportation. It is the City's preference to use Synchro software to evaluate signalized intersections, with supplemental analysis for unsignalized or roundabout controlled intersections performed with Highway Capacity Software or SIDRA software. Performance measures of effectiveness shall include level of service, vehicle delay, and volume-to-capacity ratio. Among

parameters input to code traffic models, standard normal ranges of saturation flow for travel lanes, general signal timing settings, normal values for percentages of heavy vehicles, peak hour factors and headway factors shall be used. Any deviation from typical values for parameters used in the HCM or any software packages shall require written approval of the Department of Transportation.

Additional technical analysis requested by DOT on a case-by-case basis may include:

- i. Arterial Travel Time and Delay
- ii. Site access & on-site circulation
- iii. Vehicle Classification
- iv. Parking Demand, Utilization and Turnover studies
- v. Queuing analysis
- vi. Sight distance analysis
- vii. Gap and Speed studies
- viii. Origin-Destination Studies
- ix. Traffic signal timing optimization
- x. Signal warrant analysis per Manual on Uniform Traffic Control Devices guidelines
- xi. Left turn phasing analysis for signalized intersections
- xii. Safety analysis and review of historical accident data
- xiii. Traffic Calming evaluation
- xiv. Pedestrian and Bicycle Level of Service
- xv. Transit Boarding, Alighting and Level of Service, and
- xvi. Evaluation of intersection geometry including turning radii, particularly related to freight movement

6.2 Data and Graphical Requirements

Traffic counts, including vehicular, pedestrian, and transit counts should be less than one year old. Traffic counts shall be performed for all critical time periods such as AM, Midday, PM or Saturday peak hours. Traffic counts shall be performed on typical midweek days – no accidents, weather events, holidays, school closures, special events, etc.

Graphics shall be included to illustrate the study area and vicinity, study intersections including photographs and lane diagrams for cross-reference, existing, background and future traffic volumes.

6.3 Traffic Forecasting

Trip generation shall be estimated using The Institute of Traffic Engineering (ITE) Trip Generation Handbook, 7th edition, 2004. Generally DOT accepts the methodology provided in the ITE Trip Generation Handbook. The most recent information available regarding a proposed development program, such as type of dwelling unit, shall be used in the analysis. Should more local or recent trip rate data be available for a specific land use, DOT reserves the right to review prior to accepting. Unless otherwise requested by DOT, all traffic forecasts shall be based on the peak hour of adjacent street traffic.

- 6.3.1 Where applicable, discounts to projected trip rates may be applied. These discounts may include:

- i. Non-vehicular mode shares (pedestrian, transit, bicycle, etc.)
- ii. Pass-By Trips
- iii. Internal Capture Trips

6.3.2 Percentages of mode shares, pass-by trips, and internal capture trips shall be fully documented and supported in the report or appendix. Acceptable documentation includes Census Journey-to-Work data, ITE data, or data provided by Applicant (e.g. employee home zip codes and transit subsidies)

6.3.3. Trip distribution shall apply sound engineering judgment, and shall be calculated separately for each distinct land use (i.e. office, retail, residential) Analysis for shopping centers and other major commercial or recreational facilities must include at the request of DOT a supplemental analysis for a typical Friday afternoon and Saturday mid-day.

7. Contents of Report

7.1 Minimum Requirements

A Traffic Impact Study report shall have at a minimum the following organization and content:

I. Existing Conditions

- a. baseline traffic data
- b. roadway geometry
- c. alternative modes of access
- d. existing levels of service, delays and volume-to-capacity ratios

II. Background Conditions, including

- a. Other current, approved, or planned developments in the study area
(A background development shall be defined as any project currently under construction or in any stage of the official development review process)
- b. Growth in existing traffic volumes
- c. Improvements to the transportation system programmed by the City or State or private forces included in the most recent Capital Improvement Program
- d. Background traffic volumes, levels of service, delays and volume-to-capacity ratios

III. Future Conditions

- a. Site Traffic Analysis
 - i. Project Description and delivery date (including phased construction)
 - ii. Trip generation
 - iii. Modal split
 - iv. Trip distribution
 - v. Network assignment
- b. Total future traffic volumes, levels of service, delays and volume-to-capacity ratios
- c. Identification of improvements necessary to mitigate traffic impact

8. Mitigation Measures

Baltimore City is committed to creating and sustaining a balanced transportation network with viable transportation choices for its residents, workers and visitors. The TIS must identify one or more reasonable improvements to the transportation system capable of providing an acceptable level of service. DOT defines acceptable level of service as a letter grade D or better.

8.1 Traffic Impact Mitigation Measures

Types of measures required by applicants to mitigate any traffic impacts may include, but are not limited to:

- i. **Roadway improvements** such as added travel lanes, new traffic signals, pavement markings, signs, signal timing and phasing adjustments, revision of on-street parking regulation, one-way or two way conversions;
- ii. **Transit, bicycle and pedestrian improvements** such as new or increased bus service, designation of bicycle lanes or routes, construction or upgrading of sidewalks;
- iii. **Transportation Demand Management** strategies such as creation of park-and-ride facilities, car pools, car shares, traffic calming measures;
- iv. **Monetary Contribution** to fund capital or operational costs for roadway, transit or infrastructure improvements

8.2 Mitigation in pre-congested areas

Where a development occurs in an area with a pre-existing failing level of service, the level of service of all intersections affected by the proposed development should be no worse than the existing level of service when the new facility opens receives its building or zoning authorization

8.3 Preliminary Cost Estimates

In proposing mitigation measures to alleviate adverse traffic impacts, preliminary cost estimates for improvements to the transportation system will be performed by DOT. The latest edition of A Policy on Geometric Design of Highways and Streets (Green Book) published by AASHTO should be utilized in conjunction with Baltimore City Department of Transportation Highway Design Standards to design geometric improvements needed for mitigation. Procedures recommended in the Green Book will be utilized in addition to the Highway Capacity Manual to determine the need for and length of auxiliary lanes. The latest edition of the Maryland State Highway Administration Cost Estimating Manual and Price Index for itemized construction costs shall be utilized to determine preliminary construction costs.

9. Approval and Implementation

9.1 Initial Submission

Upon completion of the draft report from the consultant, the report shall be considered by the Department of Transportation and a panel of representatives of other City agencies, as may be requested by the Department

9.2 Department Review

The Department reserves the right to request additional technical analysis, based on the draft report. In no case shall the Traffic Impact Study be final until approved by the Director or his designee. Upon approval of the report, the report shall be transmitted, with all appendices and supporting materials and requested mitigation measures, to the Applicant.

9.3 Mitigation Negotiations

Upon receipt of the completed Traffic Impact Study, it is the responsibility of the developer to respond in writing any to any proposed mitigation necessary to avoid or reduce adverse impacts identified in the Traffic Impact Study. The applicant and DOT shall negotiate in good-faith to determine said mitigation and the payment of any costs related thereto.

9.4 Developer Agreement

Within 30 days after successful negotiation of a Traffic Mitigation Agreement, the Department shall submit the Agreement for approval by the Board of Estimates.

9.4.1 *Planned Unit Developments*

Mitigation for Planned Unit Developments (PUD) may be included as part of the PUD legislation, as a separate Memorandum of Understanding, or as a zone-based fee assessment for the entire project.

9.5 Department Approval

Upon completion of the mitigation negotiations and execution of any agreements related thereto, DOT shall provide a the applicant with a letter noting the completion of the Traffic Impact Study requirements, as well as notification in the City Permit internal database. DOT will not relate any letter until and unless full payment has been made for the conduct of the Traffic Impact Study.

9.6 Public Notification

As part of the Development Review Process, the results of the Traffic Impact Study will be made public and available in accordance with the Maryland Public Information Act, Md. Code Ann., State Govt. 10-611 § et. seq.

9.7 Statue of Limitations

The Department's approval of a Traffic Impact Study shall expire if the building permit is not applied for within two years of completion of a Traffic Impact Study.

APPROVED

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